

1 will come from Stephen Berger with TEM Consulting.  
2 Please go ahead.

3 MR. BERGER: Thank you. I'd like to  
4 bring some network-based comments, talking about  
5 two networks. The first is the supply chain  
6 network that develops technology builds and  
7 supports, broadband networks and services, and the  
8 second is the networks themselves.

9 I think it's clear that healthcare is  
10 not the technology driver but it has to  
11 participate in these networks. It just simply  
12 isn't large enough to create the new technologies  
13 and independent networks in parallel with the main  
14 stray networks that exist and will be built in the  
15 future.

16 The issue in my view is that healthcare  
17 delivery has different quality needs and even  
18 metrics than other users of the networks and the  
19 dominant drivers for those networks. So, the  
20 question becomes how do we make sure that in the  
21 future healthcare delivery can maintain its  
22 quality needs and unique metrics it has while

1 using mainstream technology? Will the network  
2 support the ability of healthcare services and to  
3 achieve their required reliability levels?

4           Clearly as we think about moving out we  
5 have to assume the past is not the future. If  
6 we're going to see wider dispersion of broadband  
7 services, devices and services of which the cost  
8 of deploying networks is a significant cost are  
9 going to have to come down. We see efforts in a  
10 variety of places to dramatically reduce network  
11 deployment cost as well as device cost, trying to  
12 reduce them by factors of 10 or more.

13           The question I think that we need to  
14 contemplate is what do networks look like if their  
15 built of equipment of 1/10th or even 1/100th of  
16 the current cost? They certainly are not going to  
17 be like the networks we have today. So, then  
18 what's the possibility of healthcare providers to  
19 achieve their quality needs on those networks?

20           Another future development -- again  
21 picking up on the past is not going to be the  
22 future -- beyond artificial intelligence I think

1 we can anticipate that we're going to have  
2 increasingly ontological-based networks in which  
3 the network itself can reason on the data it's  
4 passing. So, let's just think about what that  
5 does fundamentally. Even the programming  
6 languages change at that point. Picture a patient  
7 calling a doctor from Houston either just before  
8 or just after Hurricane Harvey that just happened.  
9 If you have an ontological-based network  
10 potentially the doctor then gets the information  
11 currently that that patient who may be asking  
12 about who knows what, some healthcare related  
13 issue, is in danger of being flooded and he may  
14 want to first treat the patient some assistance in  
15 getting relocated versus the thing they called  
16 about. Or alternately let's say that call happens  
17 today and the network provides the doctor because  
18 it sees a connection the information that there is  
19 a flood claim on the patient's house. The doctor  
20 may then want to explore whether mold and impacts  
21 of mold are an important component in the  
22 patient's healthcare picture.

1           I would also champion the comments that  
2       have been made about important ways this is a risk  
3       management issue and we need to remember the  
4       possibility of low probability-high impact events.  
5       Clearly today we're all aware of Harvey, Maria,  
6       Mexico City and what's the probability of any one  
7       of those things let alone three of them in a short  
8       timeframe and looking to the future are we  
9       planning networks and healthcare delivery that can  
10      withstand natural disasters and even multiple  
11      natural disasters?

12           So, I would say it's not enough just to  
13      make spectrum available to healthcare. Spectrum  
14      needs to be made available in ways that attract  
15      supply chains to develop and deploy technology and  
16      networks in ways that meet the dispersion needs  
17      reaching rural and disadvantaged communities, but  
18      also do so in a way that healthcare providers can  
19      maintain the quality levels that they need to  
20      achieve as they delivery healthcare. And then it  
21      needs to be maintained in a variety of  
22      circumstances, particularly in disaster scenarios

1 and others, that healthcare delivery can continue  
2 to be delivered.

3 Thank you for the opportunity and I look  
4 forward to the rest of the conversation.

5 MR. PERAERTZ: Thanks Stephen. That was  
6 an awful lot of really great stuff. I very much  
7 appreciate it. I hope I can follow up with a  
8 couple of detailed questions on your  
9 recommendations if we have time.

10 MR. BERGER: Sure.

11 MR. PERAERTZ: Tony, could you please  
12 announce the next participant?

13 OPERATOR: Thank you. That next comment  
14 comes from Jodi Goldberg with Hughes Network.  
15 Please go ahead.

16 MS. GOLDBERG: Hi, and I want to echo  
17 everyone's gratitude for hosting this call. I  
18 think it's a very important initiative that the  
19 FCC is hosting. Hughes is the largest satellite  
20 broadband provider in the United States and  
21 globally. We recently launched our newest  
22 (inaudible) satellite in December and started

1 service on it in March.

2 FCC defines broadband speeds as 25-3  
3 ubiquitously across the United States from Puerto  
4 Rico into southeastern Alaska. We're excited to  
5 be able to assist in providing telehealth services  
6 throughout the United States, especially in  
7 communities that aren't as connected as urban  
8 centers. We believe that we are an excellent  
9 partner in these initiatives.

10 We're currently working on managed cloud  
11 access and cloud services for hospitals to help  
12 with patient portals, medical record-sharing.  
13 Hughes has a long history in distributive networks  
14 which is actually one of our biggest avenues, one  
15 of the areas that we focus on through our  
16 satellite networks and through our ground  
17 infrastructure.

18 We are also focused on senior care and  
19 providing different access to skilled nursing  
20 facilities, post-acute care facilities in  
21 residential communities where healthcare is woven  
22 into the operational environment to make sure that

1       they can connect with their doctors whether  
2       they're local or commuting between cities.

3               To echo what Ethan was saying, one of  
4       the benefits of satellite broadband is that it is  
5       reliant and it is cost- effective. The broadband  
6       that we provide through our satellite network is  
7       actually cost-comparable to a terrestrial network  
8       and the speeds are comparable. Where people start  
9       to get concerned about satellite broadband is the  
10      issue of latency. Often latency gets a bad rep  
11      when talking about satellite broadband because  
12      people become concerned about the delays in  
13      services, but what we actually notice latency in  
14      is a lot less significant than what most people  
15      think. It's really just in things like high speed  
16      interactive gaming or if you actually want to do  
17      robotic surgery.

18             But a lot of telehealth services would  
19      benefit from the addition of satellite services  
20      because it's large data files or voiceover IP and  
21      connecting people with their doctors, and these  
22      are services that actually are highly beneficial

1 through satellite services and the connections  
2 that we can make. So, it's actually facilitated  
3 by these wide networks that we provide and this  
4 ubiquitous service that connects these communities  
5 to their doctors.

6           So, we think it's very important that we  
7 focus on what is currently available and what will  
8 be available in the future. The truth is  
9 satellite broadband capacity is increasing greatly  
10 and there are a lot of filings for additional  
11 capacity at the FCC. My company has recently  
12 filed to construct and launch an additional  
13 satellite in the next four years. There are  
14 several non-geostationary satellite  
15 constellations, which Suzanne Malloy from SES is  
16 also on the call and can talk to, which will have  
17 a lower latency than most terrestrial networks  
18 actually. She can speak to that hopefully. And  
19 they will add additional capacity to communities  
20 that do not have access to built-out terrestrial  
21 networks.

22           It's important that when designing



1 regulations going forward we consider the fact  
2 that regulations have to be technology neutral to  
3 allow the technologies that have the ability to  
4 build out to these communities, that can connect  
5 these communities and provide telehealth services  
6 now and in five to ten years, that they're the  
7 ones who are able to provide the services, and  
8 that they're the ones who are able to get the  
9 funding they need to build out into these  
10 communities.

11 Because the truth is satellite broadband  
12 is available now and in these communities that  
13 need it. It's available in southeastern Alaska  
14 and at 25-3 speeds. Unfortunately a lot of people  
15 don't know that it's there. One of the most  
16 important aspects is to make sure people know it's  
17 there, and that it's available, and that it works  
18 really well, and that it can enable these  
19 telehealth services to take root and be available  
20 to their customers.

21 MR. PERAERTZ: Thank you very much,  
22 Jodi. That was a very passionate and persuasive

1 argument again for the importance of satellite  
2 connectivity.

3 I think, Tony, we should pause at this  
4 moment and just -- our intention was to get  
5 through four questions before 3:00 o'clock and  
6 using this format it doesn't look like we're going  
7 to be able to go to the next three questions in  
8 successive order the way that we had planned.

9 So, what we would like you to do is ask  
10 you about a couple of issues that we would like  
11 you to provide us some information on during this  
12 phone call. One of them is the type of  
13 connectivity and connectivity speed that is going  
14 to be necessary to the support to the deployment  
15 of health IT applications today and in the near  
16 future, connectivity whether it be fixed,  
17 wireless, or mobile wireless, as well as  
18 connectivity speeds.

19 Jodi was talking about this a little bit  
20 when she mentioned that since medical services  
21 require large data sets, the transfer of large  
22 data sets, at the Task Force we've been really

1       trying to figure out what level of connectivity  
2       and connectivity speeds will be necessary to  
3       enable the deployments of advanced technologies in  
4       the future.

5               I think Yahya has another question that  
6       he would like you to focus on.

7               MR. SHAIKH: Well, in relation to  
8       existing product offerings you might have are  
9       there any that, for example, might require  
10      physical deployments that might shift to the cloud  
11      if sufficient cloud activity exists? Or are there  
12      innovations that are currently being shelved or  
13      features not currently being deployed in existing  
14      products because of limitations with connectivity,  
15      whether it's the issue of speed or whether it's  
16      the issue of coverage or anything else related to  
17      connectivity which prevents sufficient market  
18      reach?

19              MR. PERAERTZ: Tony, you can identify  
20      the next participant.

21              OPERATOR: Thank you. That will come  
22      from Syed Hosain with Aeris Communications.

1 Please go ahead.

2 MR. HOSAIN: Thank you very much. I  
3 thank the FCC for the opportunity to speak over  
4 here. Very quickly I'll talk about who Aeris is  
5 and then dive into some of the applications which  
6 might determine the technology in questions that  
7 you have raised here.

8 We are a provider of IOT services all  
9 the way from connectivity to analytics including  
10 our cloud-based analytics solutions, and we've  
11 been providing this for more than two decades. I  
12 am one of the founders of the company (inaudible)  
13 CTO responsible for architectures for the future.

14 In terms of number of cellular units  
15 which is what we deploy today we're the third  
16 largest in the U.S. and sixth largest globally.  
17 We offer services around the world, but are based  
18 here in North America and a large majority of our  
19 devices are obviously based right here in the  
20 U.S., Canadian, and Mexican markets.

21 Healthcare is the most rapidly growing  
22 opportunity in the IOT industry that our customers

1     which are enterprises are deploying. That  
2     necessarily drives us to be concerned about some  
3     things that I'll talk about in a second. I'd like  
4     to give you a couple of examples overseas and then  
5     come right back to the U.S.

6             We are working with organizations that  
7     are working on vaccine quality monitoring in  
8     Africa, and for that technology to work properly  
9     just the availability of even a simple 2G  
10    connectivity service is sufficient because frankly  
11    while the next generation broadband technologies  
12    will enable capabilities that are somewhat more  
13    futuristic today's deployments of healthcare IOT  
14    devices simply doesn't need them. Wide coverage  
15    and longevity is far more important so something  
16    like that vaccine application at 2G coverage is  
17    sufficient.

18            In India we're working with a company  
19    that is providing a tuberculosis medication  
20    compliance monitoring device that is incorporated  
21    as a battery-powered unit inside the box itself so  
22    every time it's opened that is a proxy for

1 medication being taken.

2 Here in the U.S. we are working with  
3 companies that are doing I will say relatively non  
4 mission-critical IOT healthcare applications. I  
5 define mission-critical in the manner that if  
6 coverage were not available or if there is a  
7 failure in the network it would not result in a  
8 medical emergency or God forbid a fatality.

9 So, applications such as home elder  
10 healthcare monitoring systems where people might  
11 be monitored for their presence in the home,  
12 monitoring their ovens, their shelves, their  
13 medicine cabinets, is something that is being  
14 rapidly deployed today. We have companies who are  
15 deploying tracking devices for shoes for  
16 Alzheimer's patients so that if they're living at  
17 home they can be monitored by their caregivers, et  
18 cetera.

19 And we're working on some capabilities  
20 for diabetic patient monitoring. The reason being  
21 that when there was a study done from one of our  
22 customers with regards to what kind of monitoring

1 of healthcare parameters that physicians wanted  
2 literally two-thirds of the doctors who were  
3 responding said they wanted weight, blood sugar,  
4 and blood pressure to be the primary monitoring  
5 that patients do. So, we're working with a small  
6 start-up that is coordinating an effort to make a  
7 sugar level monitor, a blood pressure monitor, and  
8 a weighing machine all connected together to  
9 provide information particularly for low income  
10 families who may not have an ISP or a home  
11 transmission device of some sort that they would  
12 be able to use our cellular network to transmit  
13 that data to their local county and regional  
14 healthcare systems and coordinate that information  
15 with supermarkets in the area who could provide  
16 coupons, for example, to those patients to allow  
17 them to get the kinds of foods that would be  
18 beneficial to improving their diabetic problems  
19 rather than causing them harm as they might tend  
20 to do otherwise.

21 In terms of the connectivity, as I  
22 mentioned, today coverage and longevity of service

1 is far more important. In a self-contained unit  
2 such as what our customers provide with these  
3 devices the ability to plug-and-play or  
4 battery-powered units is essential. What 5G and  
5 other technologies in the future might enable are  
6 perhaps more mission-critical apps where these  
7 speeds and the necessary transmission of medical  
8 information associated with medical emergencies  
9 might be more relevant. Today we don't see that.  
10 And the benefit of having widespread coverage in  
11 the future for those what I will call the more  
12 speed-oriented technologies would be essential.

13 I'd like to thank you all for the  
14 opportunity to provide this information. If there  
15 is any additional information that we can provide  
16 later on we'd be happy to do so.

17 MR. PERAERTZ: Tony, I would like to ask  
18 Z a follow up question. Z, because Aeris is able  
19 to manage its always-on, 24-7 connectivity across  
20 2G, 3G, 4G, LTE, LTEM networks I think you have a  
21 unique view into the spectrum needs for the future  
22 of healthcare. In our PN we specifically ask for



1       how could the Commission make an assessment of the  
2       spectrum in the wireless infrastructure needs for  
3       the future of health and care in the United  
4       States?

5               Because time is short I would appreciate  
6       it if you could provide just a broad general  
7       approach that the Commission could take to  
8       ensuring that we have sufficient spectrum and  
9       think about other sort of coexistence issues that  
10      we need to think about going forward to ensure  
11      there is sufficient spectrum for the future of  
12      health.

13             MR. HOSAIN: Yes, that's a very good  
14      question. The issue is very simplistically that  
15      we piggyback on the cellular networks that are  
16      deployed for entirely other purposes. The  
17      applications that are running IOT cloud for less  
18      than 1 percent of the revenue of a typical large  
19      carrier in the United States, and therefore change  
20      technology decisions tend to be driven by the  
21      smartphone user community rather than the IOT  
22      community, let alone healthcare that is using

1       those kinds of technologies.

2               So, I think that in particular the way  
3       we manage it is that we like to be as technology  
4       agnostic as we can from our support perspectives.  
5       We have built in solutions for monitoring the  
6       device performance regardless of the technologies  
7       operating, including hybrid solutions that include  
8       both Wi-Fi such as the information from Comcast or  
9       satellite services that was mentioned earlier  
10      today. For us, information and processing that  
11      data is far more important so we will be very  
12      careful to locate a device no matter where it  
13      happens to be, which network it happens to be  
14      operating in, to provide the kind of reach and  
15      connectivity that is necessary.

16             Now, from a perspective of capacity,  
17      today's applications simply don't have to worry  
18      about that yet because even 2G is quite sufficient  
19      for a large class of applications such as  
20      reporting basic health parameter monitoring, et  
21      cetera. It's the more futuristic applications  
22      that I think will require extensive coverage in 5G

1 and LTE expansion, more spectrum expansion for the  
2 networks that are available today. Since we  
3 piggyback traditionally those networks are  
4 deployed by the larger carriers who have the  
5 ability put the tower resources up to make  
6 coverage happen as best they can.

7 MR. PERAERTZ: Great, thank you. For  
8 other participants who have a unique view on  
9 wireless spectrum needs of healthcare participants  
10 if we have time I would appreciate it very much if  
11 you could think about the question I just posed to  
12 Zaeem of Aeris. Thank you.

13 Tony, would you announce the next  
14 participant please?

15 OPERATOR: Thank you. That next comment  
16 will come from Colin Underwood with Alaska  
17 Communications. Please go ahead.

18 MR. UNDERWOOD: Hello, thank you very  
19 much to the Committee for hosting all of us on  
20 this important topic. My name is Colin Underwood  
21 and I am the Healthcare Program Manager for Alaska  
22 Communications, a telecommunications provider

1 providing consumer and business commercial  
2 services in the great state of Alaska. Among  
3 those commercial and business providers we provide  
4 services to healthcare and education customers.

5 I would just like to first voice my  
6 support of everything that Dr. Stewart Ferguson  
7 mentioned earlier. He and I have the privilege of  
8 working together as one of the telecommunications  
9 providers providing connectivity to his  
10 organization and some of the other tribal health  
11 organizations around the state. What he spoke  
12 about in the critical need of telecommunications,  
13 universal services, is something we all see here  
14 in Alaska.

15 However, I would like to add to what  
16 everyone has been saying on consumer need  
17 broadband connectivity as well. To really  
18 recognize the potential for telehealth consumers  
19 are going to need this connectivity in their  
20 homes, as we in Alaska in many cases do not have  
21 that access and where it is accessible it may not  
22 be affordable. So, we see consumers not able to

1 recognize the full potential of telehealth  
2 services.

3 One way to meet that demand is through  
4 wireless technologies. Needless to say, it is  
5 very expensive to build in very remote Alaska any  
6 wired infrastructure to these homes that are  
7 across mountain ranges, through rivers, lakes,  
8 miles and miles away. So one avenue we are  
9 looking at is wireless deployments using a  
10 fiberoptic network terrestrial service to bring  
11 into a community and then deploy a wireless mesh  
12 network across the community that would then  
13 benefit consumers, small businesses, healthcare,  
14 and education businesses alike.

15 However, to make such a network  
16 available as I mentioned requires a strong  
17 terrestrial network, the backbone to bring that  
18 connectivity in there. I've heard many people  
19 talk about wireless technologies, spectrums, and  
20 5G technologies; those are all great, we are  
21 looking at those. I heard someone mention earlier  
22 TV white space. That's a technology we're looking

1 at as well as millimeter wave technologies to  
2 deploy these in a much more cost-effective manner.

3 I'm going to come back to Alaska lacking  
4 infrastructure. Technology, I'm going to equate  
5 it to much like an elementary school where you  
6 have a third grade class and you might have one  
7 third-grader that is reading at a fifth grade  
8 level and you have another third-grader that's  
9 reading at maybe a second grade or third grade  
10 level. You're not going to want to give both of  
11 these the same reading material and expect them to  
12 advance at the same manner; you're going to give  
13 that one student who is advanced something a  
14 little more challenging and that other student  
15 something that's more appropriate for their level,  
16 that way both are going to feel success and  
17 advance.

18 Technology is much the same way. The  
19 idea that there is one solution for the entire  
20 country is not always the case. In Alaska we are  
21 lacking infrastructure and that is reflected in  
22 basically our 25 percent use of the Universal

1 Services Fund for rural healthcare. Those high  
2 costs are due to lack of infrastructure and  
3 competition, real competition, in the state of  
4 Alaska.

5 So, I'd ask the Committee to consider as  
6 we go forward looking at the future ways that we  
7 can encourage different regions in the country to  
8 advance and get the benefits they need while also  
9 supporting the higher advancements of other parts  
10 of the country. For the entire country to really  
11 truly benefit from the advancements of digital  
12 healthcare and telehealth we need not only the  
13 healthcare centers to have good connectivity but  
14 also the consumers at an affordable level.

15 Lastly, as far as broadband speeds go we  
16 have seen just in the past couple of years  
17 critical access hospitals and community health  
18 centers in Alaska asking more and more for 100 meg  
19 and even in some cases, some of the larger rural  
20 locations, even gig services to support the EICU  
21 and other advanced real-time critical care  
22 delivery systems that are out there. This is in a

1 large part due to a few years ago Congress passed  
2 laws that said, you know, thou shalt adopt digital  
3 healthcare, electronic health records, that sort  
4 of thing and we've seen healthcare really take off  
5 in this field. As a consequence the demand in  
6 connectivity in broadband has exponentially grown.

7 In conjunction with that the USAC and  
8 the FCC have seen to add additional service types  
9 in facilities that are eligible to participate in  
10 the Rural Healthcare Program. So, we've had two  
11 major impacts to the Rural Healthcare Fund and at  
12 no time has that fund been adjusted to match this  
13 increase in both the broadband demand that's being  
14 brought in by laws, saying thou shalt adopt  
15 digital transformation, and also the additional  
16 demand from new facility types. And rightfully  
17 so.

18 But I ask the Committee to think both  
19 about how we can incentivize different parts of  
20 the country for their own acceleration as well as  
21 how we can address the Rural Healthcare Program  
22 and its funding caps issues right now. As Stewart



1       Ferguson mentioned it is a critical, critical need  
2       in Alaska and is the only reason we are able to  
3       see the success we have in Alaska. Thank you very  
4       much.

5               MR. PERAERTZ: Thank you very much,  
6       Colin. Enabling communities to find solutions  
7       that are tailored to the unique situations of  
8       those communities is something that the  
9       Connect2Health Task Force is laser focused on.

10              Tony, would you please announce the next  
11       participant?

12              OPERATOR: Certainly. The next comment  
13       will come from the line of Suzanne Malloy with SES  
14       Networks. Please go ahead.

15              MS. MALLOY: Hi, this is Suzanne Malloy  
16       and I'm Vice President of Regulatory Affairs for  
17       o3b, which is now going to be known as SES  
18       Networks. We really appreciate the opportunity to  
19       participate in this particular forum to explain  
20       how specifically satellites fit in to helping  
21       deliver the kinds of services and applications  
22       we've been talking about on the call.

1           By way of introduction into who we are  
2           and the facilities we use to provide our services,  
3           SES is one of the world's largest commercial  
4           communication satellite operators operating more  
5           than 50 geostationary satellites that can reach 50  
6           percent of the world's population. Many of these  
7           satellites have been authorized under commission  
8           authority.

9           The specific division that I work for,  
10          SES Networks, formerly known as o3B, provides high  
11          throughput low-latency connectivity via a  
12          non-geostationary satellite network that delivers  
13          performance of fiber in places where terrestrial  
14          networks don't reach. It makes this broadband  
15          connectivity affordable for billions of consumers  
16          and businesses globally in reaching 180 countries.

17          SES Networks provides these capabilities  
18          over a 12 satellite medium-earth orbit satellite  
19          constellation and we will be launching starting  
20          next year 8 additional satellites using additional  
21          spectrum to address what is a really fast growing  
22          demand for the kind of high performance

1 connectivity that we can provide.

2 SES is unique in that it's the only  
3 joint medium- earth orbit and geostationary  
4 satellite operator in the world and can therefore  
5 access both of the satellite technologies to  
6 deliver telehealth, eHealth applications, and  
7 telemedicine services. These would be in hard to  
8 reach areas that have limited internet access.  
9 SES Networks NEO-enabled satellites provide low  
10 latency and high throughput connectivity, and I  
11 emphasize those two points because these are at  
12 speeds that can support 4G or LT applications like  
13 cloud computing. These capabilities allow for  
14 really fast, flexible, and affordable solutions to  
15 challenges that we have in delivering telemedicine  
16 and eHealth applications.

17 SES uses spectrum in the CKU and KA  
18 bands to support a range of eHealth applications.  
19 Just as Hughes and Inmarsat have noted, this  
20 spectrum supports both geostationary and  
21 medium-earth orbit eHealth applications depending  
22 on the specific requirements of each activity, and

1     which particular speed and latency are needed for  
2     the specific applications that we're talking  
3     about. So, the speed and latency that we've been  
4     talking about are just a few of many factors that  
5     determine how you can effectively deliver advanced  
6     satellite technologies or advanced eHealth  
7     technologies.

8             SES' effort to specifically provided  
9     satellite connectivity to maternity and children's  
10    hospitals, floating hospitals, and mobile clinics,  
11    as well as to military ships and to humanitarian  
12    response vehicles. So, a couple of examples would  
13    be an SES collaboration with the Luxembourg  
14    government called SATMED. It's an IT-enabled  
15    cloud infrastructure that facilitates data  
16    exchanges between professionals and medical  
17    facilities and framework. Specifically SATMED  
18    provides satellite connectivity for areas where  
19    there is inadequate mobile or terrestrial internet  
20    coverage. It also provides eHealth tools in a  
21    single access platform, so this would cover the  
22    full spectrum of eHealth including eLearning,

1 eCare, eSurveillance. This would also include the  
2 ability to maintain medical records, and a  
3 specific example might be having at-home nurses  
4 have the ability to videoconference with nurses in  
5 hospitals.

6 The services were deployed for the first  
7 time during the 2014 Ebola outbreak in Sierra  
8 Leone. Other deployments have included a  
9 maternity hospital in Benin, a children's hospital  
10 in Niger, and three floating hospitals in  
11 Bangladesh.

12 Now, that's a well-known existing  
13 technology but the NEO constellation, medium-earth  
14 orbit constellation, can offer low latency and  
15 very high throughput. It combines the kind of  
16 capabilities that we just talked about for  
17 geostationary satellites, with one particular  
18 example being rapid response vehicles. This is  
19 the kind of application that can be used in  
20 something like restoration which with the recent  
21 hurricanes is a very sort of real need. So, this  
22 particular rapid response vehicle is the first

1 mobile platform that can offer collaborative  
2 communication technologies over multiple orbits  
3 and frequencies, specifically, the band user Ku,  
4 Ka and military X-band. It works across the  
5 geostationary fleet and across the NEO  
6 constellation. Using this rapid response vehicle  
7 we can provide high speed connectivity and  
8 communication services globally that can be  
9 tailored to a range of commercial, civil,  
10 humanitarian, and defense missions including  
11 telemedicine.

12 One thing I wanted to mention is that  
13 satellite services can operate hand in glove with  
14 terrestrial services and they do. So, they  
15 support local terrestrial applications. One of  
16 the unique capabilities of satellite is one to  
17 many transmissions of information or satellite  
18 services can support terrestrial services by  
19 extending their reach of terrestrial networks.

20 In the future our own satellite  
21 deployment and those of the others in the industry  
22 will include innovations and increases in

1 throughput that will enable support of the kinds  
2 of terrestrial networks that we're hearing about  
3 on this call while they develop. And they will  
4 also enable the provision of even more advanced  
5 satellite services directly to end users via  
6 satellite.

7 If there is time for questions I'm happy  
8 to take them. But again, thanks for the  
9 opportunity to participate in this forum.

10 MR. PERAERTZ: Thank you very much,  
11 Suzanne. Tony, would you please announce the next  
12 participant?

13 OPERATOR: Thank you. That's from Tim  
14 Koxlien with Telequality. Please go ahead.

15 MR. KOXLIEN: Thank you, Tony. Thanks  
16 to the Task Force for the opportunity to talk with  
17 you. You had brought up the connectivity type  
18 speed and then also added some cloud issues. I'll  
19 really not spend much time talking about the other  
20 items, I think your other guests have spent time  
21 talking about infrastructure and so on.

22 We're a telecommunications company that

1 services healthcare providers throughout rural  
2 America. It's great to hear the important  
3 initiative that the chairman has at the FCC on  
4 bridging the digital divide. Lots of ideas going  
5 on with regards to the MPRM and so on, and I'll  
6 just leave it at that for what's written down.  
7 But I'd like to touch on two items in terms of  
8 connectivity type and speed.

9 We serve about almost a thousand  
10 locations throughout rural America. The type of  
11 connectivity that we have is pretty much probably  
12 two-thirds fiber and the remaining amount mainly  
13 copper but with some coax. There are some  
14 wireless connectivity serving those locations that  
15 can't get reasonable priced access into those  
16 sites. But pretty much anything that can get them  
17 a good amount of bandwidth is satisfactory until  
18 higher bandwidths or better latency can be taken  
19 care of by buildout, whether it's wireless or  
20 wireline or anything else.

21 When we take a look at a lot of these  
22 applications too I think we've talked about an



1       enabled --

2               MR. PERAERTZ: Excuse me? Tony, are you  
3       there?

4               OPERATOR: Lines are still open.

5               MR. PERAERTZ: It's now two minutes past  
6       3:00. We would like the listening session to  
7       extend for about another 15, 20 minutes if that's  
8       okay.

9               OPERATOR: Certainly, you may proceed.

10              MR. KOXLIEN: Is that referring to me  
11       with a couple more comments regarding speed?

12              MR. PERAERTZ: No, please go ahead, Tim.  
13       We'd love to hear from you.

14              MR. KOXLIEN: Well, we have seen speeds  
15       increase in the last three years. Our average  
16       customer was using an average of 7 meg, it is now  
17       up over 300 on our average customer sites. It's  
18       more than just the typical healthcare applications  
19       that these folks need, they are also using these  
20       services for emails, internet access, training, et  
21       cetera. So the bandwidth needs going into a  
22       specific location are beyond just the healthcare

1 delivery. It also includes the important business  
2 administration needs for that facility as well.  
3 So, these increases have continually exponentially  
4 grown, and I would say that the number one  
5 indicator that's really driving that is the  
6 electronic health records systems themselves  
7 because these businesses are now being operated in  
8 a digital format versus with what it had been in  
9 the past.

10 The next item I think is really  
11 important for the Commission to look at and  
12 understand, and this probably incorporates  
13 interagency work on behalf of the FCC and other  
14 agencies, and that is there is a lack of skillset  
15 within especially rural America in supporting the  
16 IT and medical tools that clinicians would be  
17 using in a telemedicine network. These people  
18 that are struggling today trying to manage the  
19 business of just getting a patient from a waiting  
20 room to an exam room are now being called upon to  
21 do some higher-skilled types of functions and  
22 roles, perform these roles within their work.

1     There is an important lack of training for not  
2     only those that are supporting, maintaining, and  
3     keeping these tools working so that the clinicians  
4     themselves can perform the medical service using  
5     these tools, but also for the clinicians because  
6     the work flow of having some of these telemedicine  
7     applications within their business is an important  
8     difference doing it in an analog environment  
9     versus digital. So, we see the skillset piece  
10    really becoming a jobs issue and something that I  
11    think the Commission should really take a look at,  
12    especially on your interagency work on shoring up  
13    this digital divide.

14           I'll leave it at that. Hopefully that  
15    addresses in terms of connectivity type fairly  
16    ubiquitous need there, speed. And I'm thankful  
17    again for the opportunity to talk with you all  
18    today.

19           MR. PERAERTZ: Tim, thank you very much  
20    for that data that you were providing, that you've  
21    seen needs go from 7 meg all the way up to over  
22    300.

1                   Tony, please announce the next  
2 participant. We have about three or four more  
3 people in queue. We would like to extend the  
4 conference until all speakers have had a chance to  
5 present what they would like to tell us. Thank  
6 you.

7                   OPERATOR: Thank you very much. The  
8 next comment will come from Stephen Berger with  
9 TEM Consulting. Please go ahead.

10                  MR. BERGER: Thank you. I just want to  
11 add one issue to the mix, and I'm going to open  
12 the issue not suggest solutions, but that is the  
13 cost and complexity of compliance. That's clearly  
14 something the FCC has a great deal of influence  
15 on.

16                  Clearly we want healthcare services to  
17 be delivered where they have the highest possible  
18 reliability which means they can operate on the  
19 greatest number of bands and protocols to find one  
20 that they can connect on, and we want them to  
21 remain technologically current. But if we look at  
22 more complex areas of regulatory compliance, and

1 we might look at the Wi-Fi DFS channels and look  
2 at how many devices support only the non-DFS --  
3 that's dynamic frequency selection channels --  
4 where there is not transmit power control, you see  
5 quite a disparity that the cost of compliance  
6 discourages devices from making use of those  
7 additional bands and channels.

8           So, it's a complex issue but I would  
9 suggest we first of all definitely want to see the  
10 FCC and the FDA coordinate for example with the  
11 newer requirements the FDA is bringing for  
12 coexistence reliability analysis. We definitely  
13 want to do anything we can to encourage high  
14 reliability equipment and part of that would be  
15 anything we can come up with creatively to lower  
16 the cost of compliance for equipment that supports  
17 multiple bands, multiple protocols. We want to  
18 improve test repeatability which is materially  
19 connected to cost of compliance. And we want to  
20 improve international harmonization. If equipment  
21 can be tested for regulatory purposes and  
22 qualified for multiple markets that's a

1       significant cost reduction. So, thank you.

2               MR. PERAERTZ: Thank you very much,  
3       Stephen. Really appreciate that and would love to  
4       hear more. If you are interested in filing  
5       comments with us on that specific point we would  
6       really appreciate it.

7               Tony, would you please announce the next  
8       participant?

9               OPERATOR: Our next comment comes from  
10       the line of Rick Schadelbauer with NTCA Rural  
11       Broadband. Please go ahead.

12              MR. SCHADELBAUER: Thank you very much,  
13       and thank you for the opportunity to speak today.  
14       My name is Rick Schadelbauer, I am the Manager of  
15       Economic Research and Analysis for NTCA-The Rural  
16       Broadband Association. NTCA is an industry  
17       association comprised of approximately 850 rural  
18       local exchange carriers, all of whom are defined  
19       as rural telephone companies under the  
20       Communications Act of 1934. All of our member  
21       companies provide a mix of advanced  
22       telecommunications and broadband services and many

1     also provide video or wireless services to the  
2     rural communities they serve despite the numerous  
3     challenges inherent to serving rural areas.

4             Many of our member companies are  
5     involved in projects with hospitals and healthcare  
6     providers to bring the benefits of telehealth to  
7     rural America. While there is a tremendous  
8     potential for telehealth to benefit rural America  
9     it's important to remember that telemedicine is  
10    not viable without access to robust and reliable  
11    broadband service. Currently rural areas lag  
12    somewhat behind non-rural areas in broadband  
13    deployment but they continue to make impressive  
14    gains due in large part to the efforts of small  
15    providers such as our member companies.

16            I'd like to just spend a couple of  
17    moments talking about a recent white paper that we  
18    published entitled Anticipating Economic Returns  
19    of Rural Telehealth. In this white paper we  
20    looked at both the quantifiable and non-  
21    quantifiable benefits of telemedicine. Now, among  
22    the non- quantifiable benefits we identified were

1 greater access to specialists, the timeliness of  
2 treatment, increased patient comfort, reduced need  
3 for transportation, benefits to the healthcare  
4 provider, as well as improved overall outcomes.

5 We looked at five quantifiable benefits  
6 as well and attempted to estimate the cost savings  
7 that would be associated with each of these  
8 benefits. Those benefits included travel expense  
9 savings, money that was not spent having to go to  
10 a distant site to seek treatment. We calculated  
11 that the U.S. average -- now, in the white paper  
12 we did this on a state by state basis, but the  
13 U.S. average for travel expense savings due to  
14 telehealth we estimated at \$5,700 per medical  
15 facility per year. Savings in terms of lost  
16 wages, which would be the time that folks would  
17 have to take away from their job to go seek  
18 treatment, we calculated the U.S. average to be  
19 \$3,400 per medical facility per year. Savings  
20 accruing to the hospital itself due to the reduced  
21 need to have full-time specialists on staff, their  
22 ability to share specialists with other



1 facilities, we calculated that to be \$20,800 per  
2 medical facility per year. Increased local  
3 revenues for lab work, so when being treated  
4 locally those moneys that would be spent for lab  
5 work would stay in the local community as opposed  
6 to going to a distant location, we estimated those  
7 savings to be between \$9,000 and \$39,000 per type  
8 of procedure per medical facility per year. And  
9 finally, increased local pharmacy revenues, again,  
10 spending would not be done remotely but in the  
11 local community, and we estimated that savings to  
12 be between \$2,300 and \$6,200 per medical facility  
13 per year depending on the specific drug  
14 prescribed.

15 So, there are substantial potential  
16 benefits to be gained from telehealth, but  
17 realizing these benefits will first require  
18 overcoming several challenges including  
19 reimbursement cost, patient privacy, and  
20 licensing.

21 Now, as I mentioned previously rural  
22 telemedicine's ultimate role in addressing the

1     significant health problems inherent to rural  
2     areas will depend in large part on the  
3     availability of an underlying future proof  
4     fiber-based broadband infrastructure, and further  
5     investment in and expansion of that infrastructure  
6     is a critical need for our nation. In rural areas  
7     particularly ongoing broadband deployment will  
8     depend in large part on the availability of  
9     critical universal service funding and that that  
10    funding be sufficient and predictable.

11           The three most critical components of  
12    the Universal Service Fund program for telehealth  
13    are the High Cost Program which allows funding for  
14    broadband deployment, the Lifeline Program which  
15    allows low income Americans to afford service, and  
16    the Rural Health Program which helps healthcare  
17    providers afford connectivity.

18           So, our member companies have begun the  
19    task of deploying high quality broadband in rural  
20    America and ongoing sufficient universal service  
21    support will allow them to continue this important  
22    work. Thank you very much for this opportunity.

1           MR. PERAERTZ: Thanks, Rick. I commend  
2 Rick's work on this topic to all the participants  
3 on this call.

4           Tony, would you please announce the next  
5 participant.

6           OPERATOR: That will come from the line  
7 of Verné Boerner with the Alaska Native Health  
8 Board. Please go ahead.

9           MS. BOERNER: Hi, there. This is Verné  
10 Boerner, President and CEO for the Alaska Native  
11 Health Board. I just wanted to say first of all  
12 thank you for hosting these forums to allow us to  
13 provide the FCC input.

14           I wanted to state our support for  
15 Stewart Ferguson's presentation. I am hoping that  
16 he's actually in the queue. I think he's got a  
17 few more points that he would like to make  
18 regarding connectivity on how 2.0 will empower  
19 healthcare delivery and another point on the  
20 future not necessarily being evenly distributed.  
21 So, I will yield my time in order to make some  
22 space for him if he's able to get in the queue and

1 speak to these issues.

2 MR. PERAERTZ: Thank you very much,  
3 Verné. We appreciate your participation in some  
4 many of the fora. Tony, would you announce the  
5 next participant?

6 OPERATOR: It comes from the line of  
7 Stewart Ferguson, Alaska Tribal Health. Please go  
8 ahead.

9 DR. FERGUSON: Good morning, and thank  
10 you very much again for the opportunity to speak  
11 here, and thank you, Verné, for yielding your time  
12 there.

13 I think I would just like to finish with  
14 two kind of key points I'd like the Task Force to  
15 be cognizant of. The first one as Verné said is  
16 really -- I call it connectivity 2.0, whatever  
17 we're calling this kind of next gen connectivity.  
18 It will empower healthcare delivery 2.0.

19 The telecommunications program and USAC  
20 support has absolutely allowed our  
21 telecommunications carriers to really change the  
22 way they deliver communications in Alaska and to

1     build a comprehensive fiber microwave network  
2     across our state. What that did is it resulted in  
3     40 percent of our communities making a shift from  
4     satellite-based connectivity to terrestrial  
5     connectivity in the last seven years. That  
6     brought reduced latency, increased bandwidth, and  
7     increased reliability.

8             More importantly, that created the  
9     possibility for us for sharing a single unified  
10    electronic health record with our rural hospitals.  
11    We tend not to put them on a shared EHR when  
12    they're satellite-based, the latencies just make  
13    it harder for the physicians to do their job. So,  
14    now we're doing something that is the ultimate  
15    goal I think for most health systems, moving our  
16    patients to a single shared electronic health  
17    record.

18            In the last six years we've created a  
19    single unified health record that's used by most  
20    of our tribal health systems. 66 percent of all  
21    the healthcare activity at more than 200 sites  
22    throughout Alaska now happens in a single

1       electronic health record. It's one of the few  
2       times that physicians thank us for their  
3       electronic health record. Our physicians will  
4       point out that, for instance, our children on the  
5       shared domain get better, more comprehensive, and  
6       more complete care. In physicians' words they say  
7       it results in seamless care, fewer mistakes, and  
8       less guessing. One physician described it as  
9       beyond fabulous.

10               The next step for us though with this  
11       better infrastructure is through the use of  
12       population health and big data solutions. We're  
13       currently deploying smarter patient registries and  
14       beginning to use predictive algorithms for patient  
15       care. We're investigating options for an  
16       enterprise analytics solution that's smarter and  
17       faster than anything we've ever seen because it  
18       will have complete patient data from all of our  
19       sites, it will run on hyper parallel computing  
20       systems in the lower 48, and it reaches all the  
21       way back to our most remote locations through this  
22       connectivity. So, the bottom line is the new

1 infrastructure that's being supported now and will  
2 be supported in the future will absolutely change  
3 the way we deliver healthcare and make it smarter  
4 and better.

5 The last point I'd like to make, and  
6 Verné pointed out, the future is not evenly  
7 distributed and that's really important to  
8 understand. The present is certainly not evenly  
9 distributed. As you think about building out 5G  
10 capability recognize that some rural villages may  
11 never have that capability. It may not be  
12 technically or financially feasible to bring 5G  
13 into villages with 300 residents with a single  
14 (inaudible) station for satellite link, but  
15 bringing 3G into these sites is transformational.

16 We recently started a pilot program to  
17 take care of some of our most desperately ill  
18 patients that need palliative care in their home  
19 because we finally have 3G abilities in the home.  
20 These patients are desperately ill. It takes more  
21 than an hour to disconnect them from the oxygen  
22 and move them across the village to the clinic for

1 a healthcare session, and imagine doing that in  
2 the winter. These patients must be seen in their  
3 homes and they only need 3G or better to do this.

4 But without subsidies or other support  
5 3G connectivity to the home is very expensive in  
6 Alaska and often there are limitations placed on  
7 usage. We have subsidies to support connectivity  
8 at clinics through USAC but it leaves a tremendous  
9 gap for the homes where there is no subsidy or  
10 support. Affordable connectivity into the homes  
11 is usually important. Simply put, the Task Force  
12 must not develop an infrastructure plan that  
13 simply broadens the existing digital divide. 5G  
14 to homes and urban areas cannot be our sole focus  
15 if we forget to deliver affordable 3G or better to  
16 homes in rural and frontier locations. Those are  
17 the places where we need it and we use it the  
18 most.

19 I know if anything we need reliable high  
20 (inaudible) and affordable connectivity and it  
21 will continue to pave the way for better  
22 healthcare in Alaska and beyond. Thank you very



1 much for your time.

2 MR. PERAERTZ: Thank you so much,  
3 Stewart. Thank you, everybody, for your  
4 thoughtful and in many cases passionate  
5 recommendations. We invite you to provide  
6 additional comments into our docket. You can do  
7 so by following the instructions in the last email  
8 we sent. If you have questions you can send them  
9 to Connect2Health@fcc.gov. Thank you. Tony,  
10 would you please close the conference?

11 OPERATOR: Ladies and gentlemen, that  
12 does conclude today's conference. Thank you for  
13 your participation. You may now disconnect.

14 (Whereupon, at 3:20 p.m., the  
15 PROCEEDINGS were adjourned.)

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## 1 CERTIFICATE OF NOTARY PUBLIC

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